

REMARKS

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Claims 35-59 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The Examiner insists that four signal points or more on a signal constellation are not described in the present specification. Applicant disagrees with the Examiner. Fig. 8 shows four signal points in case of QPSK. Further, as described at lines 5-8 of the page 9 in the present specification, the possible signal points are expressed according to the equation (7). In equation (7), each of ISil indicating a length along an in-phase axis and ISiQ indicating a length along a quadrature-phase axis is formulated by $in/2$. Because 2π is four times $\pi/2$, the equation (7) indicates four signal points on a signal constellation. Fig. 3, Fig. 5, Fig. 6 and Fig. 7 shows signal points of which the number is higher than four. Therefore, applicant believes that four signal points or more on a signal constellation are disclosed in the present application.

Claims 56 and 57 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The Examiner is of the opinion that a frequency offset between the transmitter and the receiver is not described in the present specification.

In consideration of this opinion, claims 56 and 57 have been amended to contain the feature of “an estimating unit estimates, by a pilot signal, a phase error in a second symbol stream”. Applicant believes that this feature is supported by descriptions at lines 5-21 of page 7 in the present specification.

Claims 35, 37, 39, 45, 47, 49, 58 and 59 are rejected under 35 U.S.C. 102(b) as being anticipated by Jasper (US Patent No. 5,381,449).

In consideration of this rejection, the claims 35 and 45 have been amended to contain the feature of “a pilot symbol is disposed on either an in-phase axis or a quadrature-phase axis in a signal constellation”. This feature is contained in the cancelled claims 39, 40, 43, 44, 49, 50, 53, and 54.

Differences between the present invention defined in the amended claims 35, 45, 58 and 59 and Jasper are described below.

In Jasper, to reduce a peak to average power ratio of a composite QAM signal, a plurality of non-constellation-based pilot symbols 84, 86 and 88 and a constellation-based pilot symbol 90 are used (see Fig. 6, column 3, lines 26-30, and column 7, lines 7-10). The pilot symbol 86 has the largest amplitude among those of the pilot symbols. Although there is the possibility that an amplitude of the pilot symbol 86 is larger than those of 16 constellation points used in a 16 QAM system, the pilot symbol 86 is not placed on either of I and Q axes in the 16 QAM system.

In contrast, in the present invention, a pilot symbol is inserted in a first stream of information symbols on a signal constellation so as to be placed on either an in-phase (I) axis or a quadrature-phase (Q) axis in the signal constellation, and the amplitude of the pilot symbol is larger than that of any of the information symbols.

Because the point of the pilot symbol is placed on either of the I and Q axes, the amplitude of the pilot symbol can be sufficiently enlarged without influencing a maximum peak power of each information symbol.

For the above reasons, applicant believes that the amended claims 35, 45, 58 and 59 are clearly distinguishable from the teachings of Jasper, and thus, the rejection under 35 U.S.C. 102(b) and the rejection under 35 U.S.C. 103(a) should now be withdrawn.

In view of the above, consideration and allowance are, therefore, respectfully solicited.

In the event the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

The Director is hereby authorized to charge any fees, or credit any overpayment, associated with this communication, including any extension fees, to CBLH Deposit Account No. 22-0185, under Order No. 20402-00579-US2 from which the undersigned is authorized to draw.

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Respectfully submitted,

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